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August 22, 2003

Receiver: **Examiner Dmitry Levitan**

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Our Ref. No.: CISCP111

Re: Serial No. 09/342,742-PROPOSED AMENDMENT

Pages Including Cover Sheet(s):

MESSAGE:

Informal Communication Regarding Proposed Amendment-PLEASE DO NOT ENTER!!

Thank you.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Natarajan et al.

Attorney Docket No.: CISCP111

Application No.: 09/342,742

Examiner: Dmitry Levitan

Filed: June 29, 1999

Group: 2662

Title: TECHNIQUE FOR COLLECTING OPERATING INFORMATION FROM NETWORK ELEMENTS, AND FOR CONTROLLING NETWORK ELEMENT BEHAVIOR IN A FEEDBACK-BASED, ADPATIVE DATA NETWORK

CERTIFICATE OF FACSIMILE TRANSMISSION
I hereby certify that this correspondence is being transmitted by facsimile to Dmitry Levitan, 703-746-8304, at the U.S. Patent and Trademark Office on August 22, 2003.

Signed: Natalie Morgan

Natalie Morgan

INFORMAL COMMUNICATION REGARDING PROPOSED AMENDMENT – **PLEASE DO NOT ENTER!!**

Proposed Amendment:

1. (currently amended) A method for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element, said method comprising:

receiving information relating to an operation of a first subset of the plurality of network elements;

providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data and calculating updated control information based on such analysis, wherein the updated control information specifies ~~a limit on the operation of~~ an adjustment amount to a control parameter of the at least one network element;

receiving the updated control information calculated by the analysis entity; and

providing the updated control information to at least one of the network elements.

REMARKS

The Examiner rejected claims 1-6, 10-18, and 40-53 under 35 U.S.C. §103(a) as being unpatentable over Abe (U.S. patent 6,108,304) in view of Hanson (U.S. patent 6,633,861).

Claim 1 is directed towards a method "for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element." Claim 1 also requires "receiving information relating to an operation of a first subset of the plurality of network elements" and "providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data and calculating updated control information based on such analysis, wherein the updated control information specifies an adjustment amount to a control parameter of the at least one network element." Claim 1 also requires "receiving the updated control information calculated by the analysis entity" and "providing the updated control information to at least one of the network elements."

In other words, updated control information which specifies an adjustment amount to a control parameter of a network element (NE) is calculated based on analysis of information that relates to the operation of a subset of network elements. This updated control information which specifies an adjustment amount to a control parameter of a NE is then provided to such NE. The present invention advantageously provides dynamic feedback for controlling and specifying an adjustment amount to a control parameter of a NE based on analysis of network operation. In other words, a feedback loop is provided for specifying an adjustment amount to a control parameter of the operation of each NE on the fly, as opposed to performing a pre-configuring operation in a single event without subsequent adjustment, *e.g.*, as part of a service subscription package.

The cited references Abe and Hansen both fail to disclose and suggest dynamically providing updated control information to a network element, where the updated control information specifies an adjustment amount to a control parameter of the at least NE and such updated control information is calculated based on the operation of a subset of NEs. In sum, both references fail to specify an adjustment amount to a control parameter of a NE, in the manner claimed. In contrast to specifying an adjustment amount to an NE, both references teach merely providing information on the bandwidth which is available in a subnetwork. Presumptively, the NE then can determine its own adjustment amount based on the provided bandwidth availability, but this adjustment amount is in no way provided to the NE.

In general, the primary reference Abe discloses a system having a network management equipment (200 of Fig. 1) which receives bandwidth values for routes connected to other network elements EA~ED (Fig. 1). The received bandwidth information is then used to calculate an available bandwidth for such routes, and this calculated available bandwidth information is sent to the network elements EA~ED so they can determine themselves which routes to use based on the provided available bandwidths for such routes. See Column 7, lines 32-60 and Column 9, lines 1-12. Abe fails to disclose providing control information that specifies an adjustment amount to a control parameter of an NE. It is respectfully submitted that Abe also fails to teach or suggest calculating updated control information which specifies an adjustment amount to a control parameter of a NE based on an analysis of information on network operation.

The secondary reference Hanson also fails to teach or suggest such limitations. In brief, Hanson merely teaches providing a network operation parameter (CUF) to a node so that the node can self-limit its operation based on such network operation parameter, rather than providing an updated control information which specifies an adjustment amount to a control parameter of a NE and which was calculated based on network operation. Specifically, Hanson teaches that the network operating parameter CUF is simply "a measure of the utilization factor, which is a measure of the utilization of critical resources..." See Column 5, lines 63-67. This CUF is used by the node to adjust its submission information rate (SIR), which is based on the provided CUF and a pre-configured committed information rate (CIR) and a pre-configured excess information rate (EIR). See Column 8, Lines 29-42. The CIR and EIR parameters are pre-configured during a subscription event and not thereafter adjusted. See Column 8, Lines 2-14. These parameters provide thresholds for each node's SIR. That is, the SIR of a node cannot be less than EIR or more than CIR. Column 7, Line 67 through Column 8, Line 2. The SIR is also dependent on the provided CUF. For example, the node adjusts its SIR upwards by a set multiplier so that it remains below the preset EIR if the CUF indicates available resource and adjusts downward by a set multiplier if the CUF so that it remains above the preset CIR if the CUF indicates no available resources. See Column 8, Lines 29-51.

Although the CUF is provided to a node so a node can determine it's own adjustments based on the CUF which indicates resource usage (as well as it's pre-configured EIR and CIR values), the provided CUF does not itself specify an adjustment amount to a control parameter of an NE of a node since it is merely a measured value of the resource utilization. Although Hansen does teach that each node has a CIR and EIR which provide limits to the node's SIR value (See Column 8, Lines 2-14), these parameters are provided at one time to each node by subscription, in direct contrast to the claimed invention where an *adjustment* of a control parameter of an NE is provided. Said in another way, Hansen fails to teach or suggest dynamically specifying an adjustment amount to a control parameter of an NE, such as an

adjustment to CIR and EIR parameters, to a node based on network operation, in the manner claimed, because Hansen teaches that such parameters are provided once during a single event, at subscription and are not thereafter adjusted. In other words, one would not be motivated to achieve the feedback system of the claimed invention, which provides to a node control information which specifies an adjustment amount to a control parameter of an NE to an NE based on analysis of network operation, by combining (1) the teachings of Abe, which merely provided a feedback loop for providing available bandwidth information to a node, with (2) the teaching of Hansen, which teaches that the CIR and EIR parameters are provided to a node in a single subscription event without subsequent adjustment. Although Hansen does teach providing a CUF parameter to each node, this parameter is merely a indication of the measured bandwidth, similar to what is taught in Abe, and does not specify an adjustment amount to a control parameter of an NE.

Additionally, the reference Abe and the reference Hansen have similar goals of providing mere measurement information such as available bandwidth (Abe) or resource utilization (Hansen) to a node so that the node can self-adjust itself. Each reference teaches that a node determines on its own how to adjust its operating parameters, based on the available bandwidth or resources. In other words, the provided information (available bandwidth or resource utilization) merely provide an indication as to what resources are currently available to the node, and does not specify an adjustment amount to a NEs control parameter, in the manner claimed. In sum, both references teach away from providing dynamic feedback of control information which specifies an adjustment amount to a control parameter of a NE, in the manner claimed.

Since both Abe and Hanson fail to teach or suggest providing to a network element updated control information which specifies an adjustment amount to a control parameter of a NE that was calculated based on network operation in the manner claimed, it is respectfully submitted that claims 1 is patentable over Abe and Hanson.